
Three New Sections and a New Subgenus of *Phyllanthus* (Euphorbiaceae)

Grady L. Webster

Davis Herbarium, Section of Plant Biology, University of California, Davis,
California 95616, U.S.A.

ABSTRACT. Three new sections of *Phyllanthus* are described: section *Antipodanthus* (subg. *Isocladius*; type *P. dictyospermus* Müller Argoviensis), 15 species of South America and Australia; section *Pityrocladus* (subg. *Emblica*; type *P. symphoricarpoides* Kunth), 5 species of tropical America; and section *Hylaeanthus* (subg. *Conami*; type *P. attenuatus* Miquel), 6 species of tropical America. Two new species are described: *P. cuatrecasanus* (sect. *Pityrocladus*) and *P. callejasii* (sect. *Hylaeanthus*). A new subgenus with unique pollen structure, *Cyclanthera* (type *P. lindenianus* Baillon), is proposed; it includes sections *Callitrichoides* and *Cyclanthera*.

Key words: Euphorbiaceae, Neotropics, *Phyllanthus*.

Phyllanthus, with over 800 species, is the third largest genus of Euphorbiaceae (Govaerts et al., 2000). The remarkable diversity in growth form and floral morphology (Bancilhon, 1971; Nozeran et al., 1984), and especially in pollen (Punt, 1967, 1987), is reflected in its complex classification, with 10 subgenera and over 30 sections (Webster, 1956–1958, 1967). Although about 70% of the species of *Phyllanthus* are confined to the Old World, the 200-plus neotropical species have not received extensive study except for the treatments of Müller (1873) for Brazil, Jablonski (1967) for the Amazon basin, and Webster (1956–1958, 1999) for the West Indies and Venezuelan Guayana. During the course of a revision of the neotropical species, a considerable number of undescribed taxa have been detected. Because the names of three newly recognized sections and a new subgenus are being cited in a study of the pollen morphology of neotropical taxa (Webster & Carpenter, 2002), they are being published here in advance of the overall revision of the neotropical taxa.

Phyllanthus* subg. *Isocladius G. L. Webster

Phyllanthus* sect. *Antipodanthus G. L. Webster,
sect. nov. TYPE: *Phyllanthus dictyospermus*
Müller Argoviensis.

A sectione *Paraphyllantho* differt disco ♀ integro, pol-

linis grana grosse reticulata; ab aliis sectionibus subgenere *Isoclado* differt foliis spiraliter insertis.

Monoecious or dioecious shrubs or subshrubs, branching unspecialized, branches smooth or papillate; phyllotaxy spiral; leaves petiolate, stipules persistent; flowers pedicellate, in axillary glomerules; sepals 5 or 6, imbricate, entire; staminate disk of 5 or 6 segments; stamens 3, filaments free or connate; anthers vertically or horizontally dehiscent; pollen grains subglobose, 3- or 4-colporate, mostly coarsely reticulate; pistillate disk patelliform; ovary glabrous, 3-locular; styles \pm free, bifid; fruits capsular, seeds smooth or verruculose.

About 15 species can be referred to *Phyllanthus* sect. *Antipodanthus*, which belongs to subgenus *Isocladius* by virtue of its unspecialized (non-phyllanthoid) branching. It appears to be the Southern Hemisphere vicariant of section *Paraphyllanthus* Müller Argoviensis. The two sections seem morphologically similar in many respects, but in section *Paraphyllanthus* the anthers are always vertically dehiscent and the pistillate disk dissected. Only 5 species have been described from South America, mostly Brazil; the others are native to Australia (species 19, 21, 25–27, 29–32, 35–37, and 39 in Bentham, 1873). A number of the Australian species have recently been treated by Hunter and Bruhl (1996, 2000). The Australian and South American species differ in some characters, the American species having mostly connate filaments and horizontally dehiscing stamens; it is conceivable that cladistic analysis may show that some of the Australian species should be referred to section *Lysiandra* (F. Mueller) G. L. Webster. The Australian species are therefore listed here but not treated in detail.

Australian species included: *Phyllanthus aridus* Bentham, *P. australis* J. D. Hooker, *P. calycinus* Labillardière, *P. carpentariae* Müller Argoviensis, *P. fuernrohrii* F. Mueller, *P. hirtellus* Müller Argoviensis, *P. maitlandianus* Diels, *P. oblanceolatus* J. T. Hunter & J. J. Bruhl, *P. scaber* Klotzsch, *P. similis* Müller Argoviensis, and *P. striaticaulis* J. T.

Hunter & J. J. Bruhl. It is possible that *P. erwinii* J. T. Hunter & J. J. Bruhl and *P. lacunarius* F. Mueller are also referable to *Phyllanthus* sect. *Antipodanthus*.

KEY TO THE AMERICAN SPECIES OF *PHYLLANTHUS* SECT. *ANTIPODANTHUS*

- 1a. Filaments connate; stems \pm terete; stipules 1–6 mm long; seeds 2–2.7 mm long; monoecious or dioecious.
 - 2a. Stipules 3–6 mm long; stems smooth; leaves on main stems > 5 mm long; dioecious.
 - 3a. Leaves on main stems > 5 mm broad; seeds reticulate or irregularly verruculose 1. *P. dictyospermus*
 - 3b. Leaves on main stems < 5 mm broad; seeds foveolate-punctate 2. *P. pinifolius*
 - 2b. Stipules 1–2.5 mm long; stems smooth or papillose; leaves on main stems mostly < 5 mm long; monoecious or dioecious.
 - 4a. Dioecious; stems papillose; staminate flowers distinctly pedicellate (pedicel > 1 mm long); pistillate sepals 5; leaf blade margins strongly revolute, tip blunt with abruptly reflexed acumen 3. *P. ramillosus*
 - 4b. Monoecious; stems smooth; staminate flowers subsessile (pedicel < 1 mm long); pistillate sepals 5 or 6; leaf blade margins not revolute, apically tapering to a straight acumen 4. *P. dawsonii*
- 1b. Filaments free; stems decurrent-angled from nodes; stipules 2 mm long or less; seeds 1.4–1.7 mm long; dioecious 5. *P. rosmarinifolius*

1. *Phyllanthus dictyospermus* Müller Argovien-sis, DC. Prodr. 15(2): 394. 1866. TYPE: Bra-zil. Minas Gerais: *J. F. Widgren 1003* (holo-type, G).

Phyllanthus regnellianus Müller Argoviensis, Fl. Brasil. 11(2): 58. 1873. TYPE: Brazil. Minas Gerais: Cal-das, A. F. Regnell II 48 (lectotype, designated here, S).

Montane scrublands, ca. 1000–1500 m, Brazil (Minas Gerais). *Phyllanthus regnellianus*, which was distinguished by Müller only on the basis of a questionable difference in seed sculpturing, shows no clear differences and is here reduced to syn-onymy.

2. *Phyllanthus pinifolius* Baillon, Adansonia I. 5: 353. 1865. TYPE: Brazil. Paraná: Curitiba, A. St. Hilaire 1559o [15590?] (holotype, P; isotype, K).

Scrublands, 1500–2800 m, Minas Gerais, Espí-rito Santo, and Paraná.

3. *Phyllanthus ramillosus* Müller Argoviensis,

Linnaea 32: 36. 1863. TYPE: Brazil, Santa Catarina: *Herb. Franqueville* (syntype, G); “Brasilia meridionali,” F. Sellow (syntype, B destroyed).

?*Phyllanthus cordobensis* (Kuntze) K. Schumann, Bot. Jah-resber. 26(1): 350. 1898. *Diasperus cordobensis* Kun-tze, Rev. Gen. Pl. 3(2): 285. 1898. TYPE: Argentina. Córdoba: San Roque, O. Kuntze (holotype, NY).

Since the Sellow syntype of *Phyllanthus ramil-losus* was destroyed, the Herb. Franqueville spec-imen logically should become the lectotype; how-ever, that specimen could not be located in the Prodromus Herbarium in Geneva. If the Herb. Fr-anqueville specimen cannot be located, *St. Hilaire 1821* (P) could be designated as a neotype. It is also possible that a duplicate of Sellow may yet be discovered.

Woodlands and scrub, 15–2700 m, Bolivia, northern Argentina, and Brazil (Santa Catarina and Rio Grande do Sul). The status of *Phyllanthus cor-dobensis* remains uncertain; Kuntze’s description is inadequate, and the single specimen is somewhat different from other collections of *P. ramillosus*; possibly it might be validated at subspecific status when better known.

4. *Phyllanthus dawsonii* Steyermark, Los Ange-les Co. Mus. Contr. Sci. 21: 13. 1958. TYPE: Brazil. Goiás: Chapada dos Veadeiros, E. Y. Dawson 14776 (holotype, R).

Cerrado and campos rupestres, 1250–1500 m, Goiás.

6. *Phyllanthus rosmarinifolius* Müller Argo-viensis, Fl. Brasil. 11(2): 60. 1873. TYPE: Brazil. Rio de Janeiro: Serra dos Orgãos, G. Gardner 5852 (holotype, G).

Recorded only from rocky slopes, 2000–2250 m, Rio de Janeiro, Brazil.

Phyllanthus* subg. *Emblica (Gaertner) Kurz
Phyllanthus* sect. *Pityrocladus G. L. Webster, sect. nov. TYPE: *Phyllanthus symphoricarpo-ides* Kunth.

A sectione *Emblica* differt sepalis plerumque 5, an-theris muticis, stylis liberis non dilatatis; a sectione *Microglochidionis* differt foliis non glanduliferis, antheris muticis, pollinis grana 4- vel 5-colporatis non diporatis.

Monoecious (rarely dioecious) shrubs, often scandent; branches and branchlets \pm scabridulous or papillate to hirtellous or scurfy; deciduous branchlets pinnatifid (not ramified), with ca. 10–50 leaves; leaf blades chartaceous, lacking a sub-

apical laminar gland; stipules persistent; flowers pedicellate, in axillary unisexual or bisexual cymes; staminate sepals 5 or 6, subequal, free, imbricate; disk segments 5; stamens 2–5(–7), filaments connate (rarely free); anthers muticous, dehiscing horizontally or obliquely; pollen grains subprolate, 4- or 5-colporate, colpi monorate and unbordered, exine reticulate; pistillate sepals 5, imbricate; disk crateriform or dissected; ovary 3-locular; styles free, spreading, bifid to unlobed; fruits dehiscent or indehiscent; seeds smooth.

Phyllanthus sect. *Pityrocladus*, which is a neotropical representative of *Phyllanthus* subg. *Embllica* (Gaertner) Kurz, includes 6 described species (and at least 1 or 2 undescribed) mainly of South America, but with one species in Costa Rica. The 4–5-colporate reticulate pollen grains (Webster & Carpenter, 2002) suggest placement in subgenus *Embllica*, even though the shape of the grains is scarcely prolate. The section, named for the characteristic scabridulous or scurfy indumentum of the axes of some of the species, is similar to section *Microglochidion* (Müller Argoviensis) Müller Argoviensis in some pollen characters but differs in its tendency to a scandent habit, more or less scurfy indumentum, eglandular leaves, and less elongated pollen grains with fewer colpi.

KEY TO THE SPECIES OF *PHYLLANTHUS* SECT. *PITYROCLADUS*

- 1a. Leaves glabrous on both faces (at most scabridulous or papillate on petiole or midrib); veins distinctly prominulous on abaxial surface; branchlets 10–30 cm long, 0.8–1.8 mm thick; with 20–35 leaves; staminate pedicels 3–7 mm long; stamens 3–6; fruiting pedicels 2–4 mm long.
 - 2a. Monoecious; leaf blades elliptic, 1.5–2.5 cm long, apically rounded and apiculate; stamens (3)4–6; fruits indehiscent; styles unlobed or apically bifid; branchlets not distinctly winged 1. *P. symphoricarpoides*
 - 2b. Dioecious; leaf blades ovate-lanceolate, 3–6 cm long, acuminate; stamens 3; fruits dehiscent; styles bifid; branchlets narrowly winged 2. *P. sponiifolius*
- 1b. Leaf blades glabrous or hirsutulous adaxially; veins not prominulous abaxially (or if so, blades distinctly hirsutulous abaxially); branchlets 5–25 cm long, 0.4–1 mm thick, with 5–75 leaves; staminate pedicels 0.5–7.5 mm long; stamens 2 or 3; fruiting pedicels 1–4 mm long.
 - 3a. Leaf blades abaxially copiously hirsutulous, with prominent lateral veins; stamens 2; styles unlobed.
 - 4a. Monoecious; branchlets 0.6–0.9 mm thick, with 5–11 leaves; leaf blades 1.5–3.5 cm long; petioles 1–2 mm long; stipules 3–4.5 mm long 3. *P. popayanensis*

- 4b. Dioecious; branchlets 0.4–0.6 mm thick, with 20–45 leaves; leaf blades 1–1.5 cm long; petioles ca. 0.5 mm long; stipules 1.5–2 mm long . . . 4. *P. ruscifolius*
 - 3b. Leaf blades abaxially glabrous or minutely scabridulous, veins not prominulous; stamens 2 or 3.
 - 5a. Leaf blades elliptic, strongly inaequilateral at base, secondary veins straight, nearly perpendicular to midrib, abaxially separated from midrib; branchlets 0.4–0.7 mm thick; stipules 1–1.5 mm long; staminate disk segments discrete, flat 5. *P. cuatrecasanus*
 - 5b. Leaf blades oblong, not inaequilateral at base, secondary veins distant, curving, not abaxially separated from midrib; branchlets 0.7–1 mm thick; stipules 2–3.5 mm long; staminate disk segments massive, ± confluent 6. *P. valerii*

1. *Phyllanthus symphoricarpoides* Kunth, in Humboldt, Bonpland & Kunth, Nov. Gen. Sp. 2: 114. 1817. *Glochidion symphoricarpoides* (Kunth) Pax & K. Hoffmann, in Engler & Harms, Nat. Pflanzenfam. ed. 2, 19c: 58. 1931. TYPE: Ecuador. Loxa [Loja]: *Humboldt & Bonpland* (holotype, P; isotype, B).

Montane thickets, 1500–2750 m, Colombia to Peru.

2. *Phyllanthus sponiifolius* Müller Argoviensis, Linnaea 32: 25. 1863. TYPE: Ecuador. *L. Fraser* (holotype, G).

Montane thickets, 1000–2000 m, Colombia to Ecuador.

3. *Phyllanthus popayanensis* Pax, Bot. Jahrb. 26: 503. 1899. TYPE: Colombia. Popayán: Páramo de Guanacas, *F. C. Lehmann 4708* (holotype, B destroyed; lectotype, designated here, K).

Montane thickets, 2000–2800 m, Colombia (Cauca). The specimen at Kew is chosen as lectotype because no other specimens of *Lehmann 4708* have been found.

4. *Phyllanthus ruscifolius* Müller Argoviensis, DC. Prodr. 15(2): 358. 1866. TYPE: Colombia. Prov. Cauca: *J. J. Triana 3659* (holotype, P).

Montane thickets, 1900–2200 m, Colombia (Valle del Cauca).

5. *Phyllanthus cuatrecasanus* G. L. Webster, sp. nov. TYPE: Colombia. Caquetá: Quebrada del Río Hacha, 2100–2250 m, *J. Cuatrecasas 8533* (holotype, US). Figure 1.

Similis *Phyllanthi valerii*, differt foliis laevibus, dola-briformis, nervis lateralibus rectis; stipulis minoribus; seg-mentis disci tenuioribus.

Dioecious shrub; branchlets terete, copiously hirtellous, 8–14 cm long, 0.4–0.7 mm broad, with ca. 20–50 leaves; leaf blades glabrous, mostly 5–7 mm broad, elliptic, abruptly acute, ± inaequilateral at base, abaxially alveolate-reticulate, veins straight, these and reticulum of veinlets prominu-lous; stipules oblong, blunt, glabrous, 1–1.2 × 0.3–0.4 mm; staminate flowers 2–5 per axil on brachy-blasts; pedicel 1.3–1.5 mm long; sepals 5, 1.3–1.6 × 0.8–1.4 mm; disk segments 5, elliptic, 0.2–0.25 mm broad; stamens 2, filaments completely connate into a column 0.5–0.6 mm high; anthers < 0.5 mm long, dehiscing obliquely; pistillate flowers unknown.

Known only from the type collection. The distin-guished collector, José Cuatrecasas, described the perianth segments as “amarillentos con nervios ro-jizos.” The specimen of *Phyllanthus cuatrecasanus* superficially resembles small-leaved forms of *P. ruscifolius*, but differs sharply from that species (as well as *P. valerii*) in the glabrous, strongly inae-quilateral apiculate leaf blades with curious glau-cous-reticulate bands alternating with green lateral veins.

6. *Phyllanthus valerii* Standley, Field Mus. Publ. Bot. 18: 619. 1937. TYPE: Costa Rica. He-redia: Yerba Buena, NE of San Isidro de He-redia, 2000 m, *P. C. Standley & F. L. Valerio 49814* (holotype, F).

Montane forests, Costa Rica, 1200–2050 m; very similar plants have been collected in Bolivia.

Phyllanthus* subg. *Conami (Aublet) G. L. Webster

Phyllanthus* sect. *Hylaeanthus G. L. Webster, sect. nov. TYPE: *Phyllanthus attenuatus* Mi-quel.

A sectione *Nothoclema* differt ramulis pinnatiformibus (non bipinnatiformibus), fructibus baccatis; a sectione *Apolepis* differt filamentis connatis, disco ♀ integro.

Monoecious or dioecious trees or shrubs; branch-lets pinnatiform, usually subtended by reduced leaves (but generally not by cataphylls); flowers in axillary unisexual or bisexual cymules borne on brachyblasts; sepals 6 (rarely 5), usually biseriate; disk of discrete segments or cupular; stamens 3, filaments free or connate; anthers muticous, de-hiscing horizontally or obliquely; pollen grains glo-bose, porate (lacking distinct colpi), exine pilate;

pistillate sepals persistent in fruit; ovary 3–5-loc-ular; styles free or connate, bifid to unlobed; fruits baccate; seeds smooth.

This new section of *Phyllanthus* subg. *Conami* (Aublet) G. L. Webster, named for the prevalent distribution of its species in lowland Amazonian forest (Hylaea), has escaped recognition partly be-cause of its vegetative resemblance to species of two sections of *Phyllanthus* subg. *Xylophylla* (L.) Persoon: section *Brachycladus* G. L. Webster (Web-ster, 2001) and section *Elutanthos* Croizat (Croizat, 1943); this has led to confusion and failure to rec-ognize the significance of the diagnostic characters. The resemblance of the globose pollen grains with pilate exine ornamentation to those of section *Noth-oclema* G. L. Webster clearly supports placement of section *Hylaeanthus* in subgenus *Conami* (Web-ster & Carpenter, 2002).

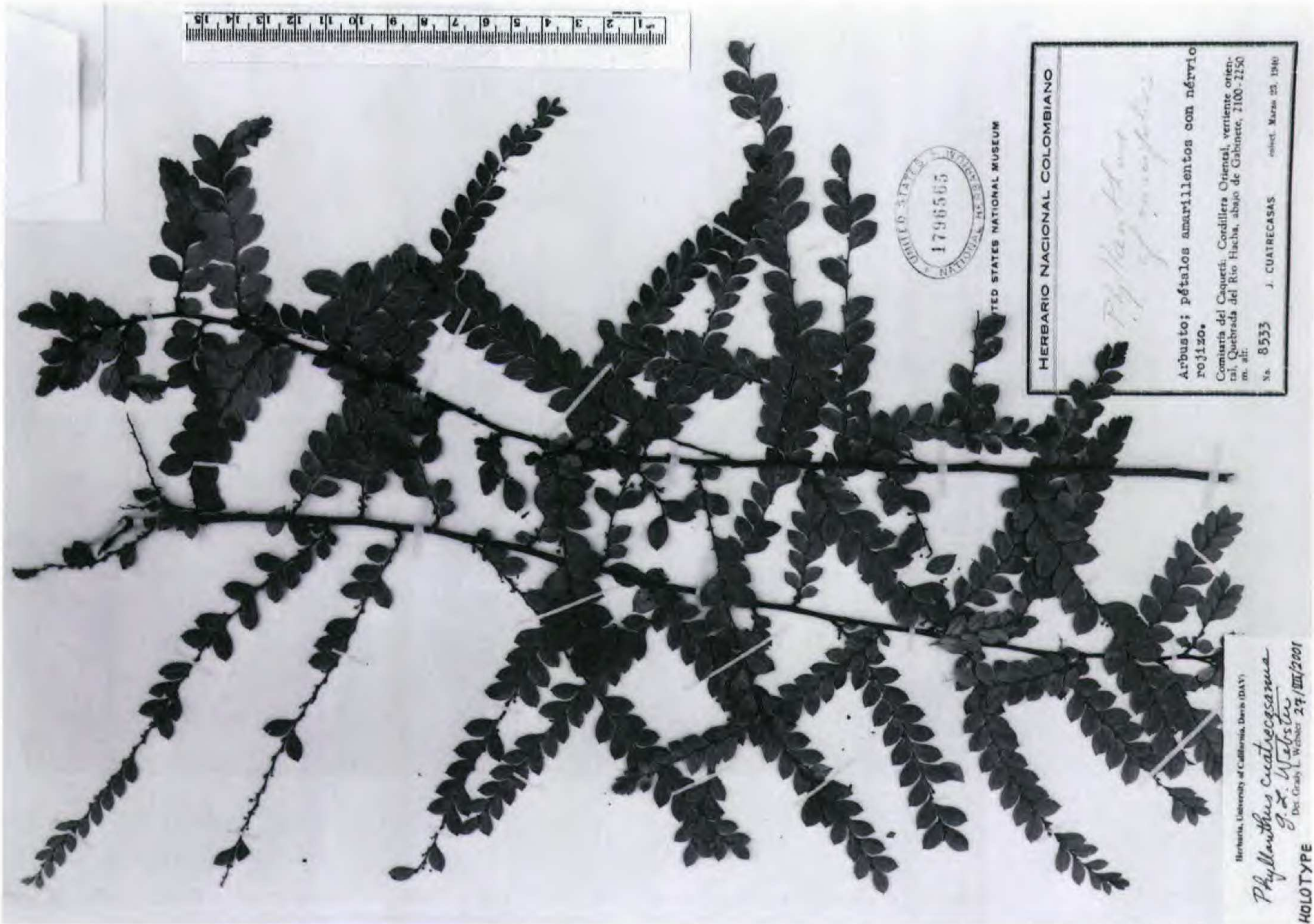
Müller (1866, 1873) created much of the con-fusion with regard to the new section *Hylaeanthus* when he mistakenly identified the type species, *Phyllanthus attenuatus* Miquel, with *P. aubletianus* Radcliffe-Smith (2001; name replacing *Meborea guianensis* Aublet). The affinities of Aublet’s *Me-borea* remain uncertain, but it seems possibly a species of section *Brachycladus*. At present, section *Hylaeanthus* includes 6 species, although addition-al species remain unpublished. It is biogeographi-cally parallel to section *Pityrocladus* in its mainly South American distribution, but with one species in Costa Rica.

KEY TO THE SPECIES OF *PHYLLANTHUS* SECT. *HYLAEANTHUS*

- 1a. Ovary 3-locular; styles bifid; monoecious or dioecious.
- 2a. Leaves completely glabrous; dioecious.
 - 3a. Leaf blades lanceolate, abruptly acuminate; styles connate 1. *P. skutchii*
 - 3b. Leaf blades usually ovate or elliptic, blunt; styles free 2. *P. manausensis*
- 2b. Leaves hirtellous at least on petiole; monoecious or dioecious.
 - 4a. Fruiting pedicels 2–4 mm long; styles free, bifid or unlobed.
 - 5a. Dioecious; styles bifid; ♂ disk entire 3. *P. attenuatus*
 - 5b. Monoecious; styles unlobed; ♂ disk dis-sected 4. *P. bernardii*
 - 4b. Fruiting pedicels 6–7 mm long; styles con-nate, twice-bifid 5. *P. callejasii*
- 1b. Ovary 4–5-locular; styles unlobed; filaments con-nate; monoecious 6. *P. madeirensis*

1. *Phyllanthus skutchii* Standley, Publ. Field Mus. Nat. Hist., Bot. 22: 346. 1940. TYPE: Costa Rica. San José: El General, A. *Skutch 4375* (holotype, F).

Evergreen forests, 20–900 m, southern Costa



Rica (Pacific slope); possibly occurring in Colombia.

- 2. *Phyllanthus manausensis*** W. A. Rodrigues, *Acta Amazonica* 1: 17, fig. 1. 1971. TYPE: Brazil. Amazonas: Manaus, W. A. Rodrigues 7520 (holotype, INPA 16822).

Lowland Amazonian rain forest, mostly on terra firme, 100–200 m, Brazil (Amazonas, Pará, Roraima, Amapá).

- 3. *Phyllanthus attenuatus*** Miquel, *Linnaea* 21: 479. 1848. TYPE: Suriname. F. W. R. Hostman & A. Kappler 305 (holotype, L; isotype, W).

Terra firme or occasionally inundated rain forest, 0–1000 m, Colombia, Venezuela, the Guayanas, Brazil, and Peru.

- 4. *Phyllanthus bernardii*** Jablonski, *Mem. New York Bot. Gard.* 17: 112. 1967. TYPE: Venezuela. Mérida: Aricagua, L. Bernardi 6258 (holotype, NY).

Andean forests, > 2000 m, western Venezuela (Mérida). The species deviates from others in *Phyllanthus* sect. *Hylaeanthus* in its character combination of monoecious flower production, winged pedicels, and small seeds (< 2 mm long). It has not yet been possible to examine the pollen, and it may prove not to belong to the section.

- 5. *Phyllanthus callejasii*** G. L. Webster, sp. nov. TYPE (pistillate): Colombia. Antioquia: Mun. Frontino, Corr. La Blanquita, región de Murri, Alto de Cuevas, 1850 m, 14 July 1988, R. Callejas, A. L. Arbeláez, J. Betancur & I. D. Castaño 6864 (holotype, HUA 52926; isotype, DAV). Figure 2.

Ab aliis speciebus sectionis differt stylis connatis bis bifidis, sepalis fructiferis majoribus, ramulis crassioribus.

Dioecious tree 6–8 m high; branchlets terete, smooth (minutely papillate), 15–25 cm long, 1.5–2.5 mm thick, with 6–9 leaves; leaf blades ovate to elliptic, 7–12 cm long, 3.5–7 cm broad, glabrous except for the incised midrib adaxially and midrib and major lateral veins abaxially, veins 5–7 pairs, curving; veinlet reticulum prominulous beneath;

petiole 5–7 × 1–1.5 mm, copiously scabrid-hirtellous; stipules blackish, triangular, 2–3 mm long. Flowers in axillary glomerules, the pistillate mostly 2–5 per axil; bracts and bractlets blackish, persistent. Staminate flowers seen only in bud; sepals 6; disk undivided; stamens 3, filaments connate, anthers dehiscing horizontally. Pistillate flowers with pedicel glabrous or sparsely and minutely hirtellous, 5.5–7 mm long in fruit; fruiting sepals (5)6, 3–3.8 mm long, 2–2.2 mm broad; disk patelliform, ca. 1.5 mm broad; ovary 3-locular; styles connate into a column ca. 1.5 × 0.7 mm; style branches 0.5–0.7 mm long, ± twice-bifid. Fruits baccate, 7–9 mm diam. (dried); seeds somewhat compressed, acute, truncate at base, 2.5–3 × 2–2.7 mm; testa smooth, brownish.

Cloud forest, 1600–1850 m, Cordillera Occidental, Colombia. *Phyllanthus callejasii* is clearly related to *Phyllanthus attenuatus* Miquel by its bifid styles and dioecious flower production, but is easily distinguished by its larger leaf blades and longer petioles, thicker branchlet axes, and longer fruiting pedicels and sepals. It differs from the lowland *P. attenuatus* and *P. manausensis* in its upper montane cloud forest habitats. *Phyllanthus bernardii*, the only other upland species of *Phyllanthus* sect. *Hylaeanthus*, has hirtellous branchlet axes, winged pedicels, and smaller seeds.

Additional collections. COLOMBIA. **Antioquia:** Mun. Frontino, Corr. Nutibara, zona de Murri, 5–8 km S de Alto de Cuevas, 1000–1850 m, 14 Feb. 1991, R. Callejas, F. J. Roldán & M. V. Arbeláez 9940 (staminate paratype: HUA 79857). **Nariño:** Mun. Piedraancha, Correg. Chucunéz, Reserva La Planada, 1650–1800 m, 18 May 1991, J. Betancur, S. Churchill & F. J. Roldán 2576 (HUA).

- 6. *Phyllanthus madeirensis*** Croizat, *Trop. Woods* 78: 7. 1944. TYPE: Brazil. Amazonas: Mun. Humaitá, between Rio Livramento and Rio Ipixuna, B. A. Krukoff 7163 (holotype, A; isotype, NY).

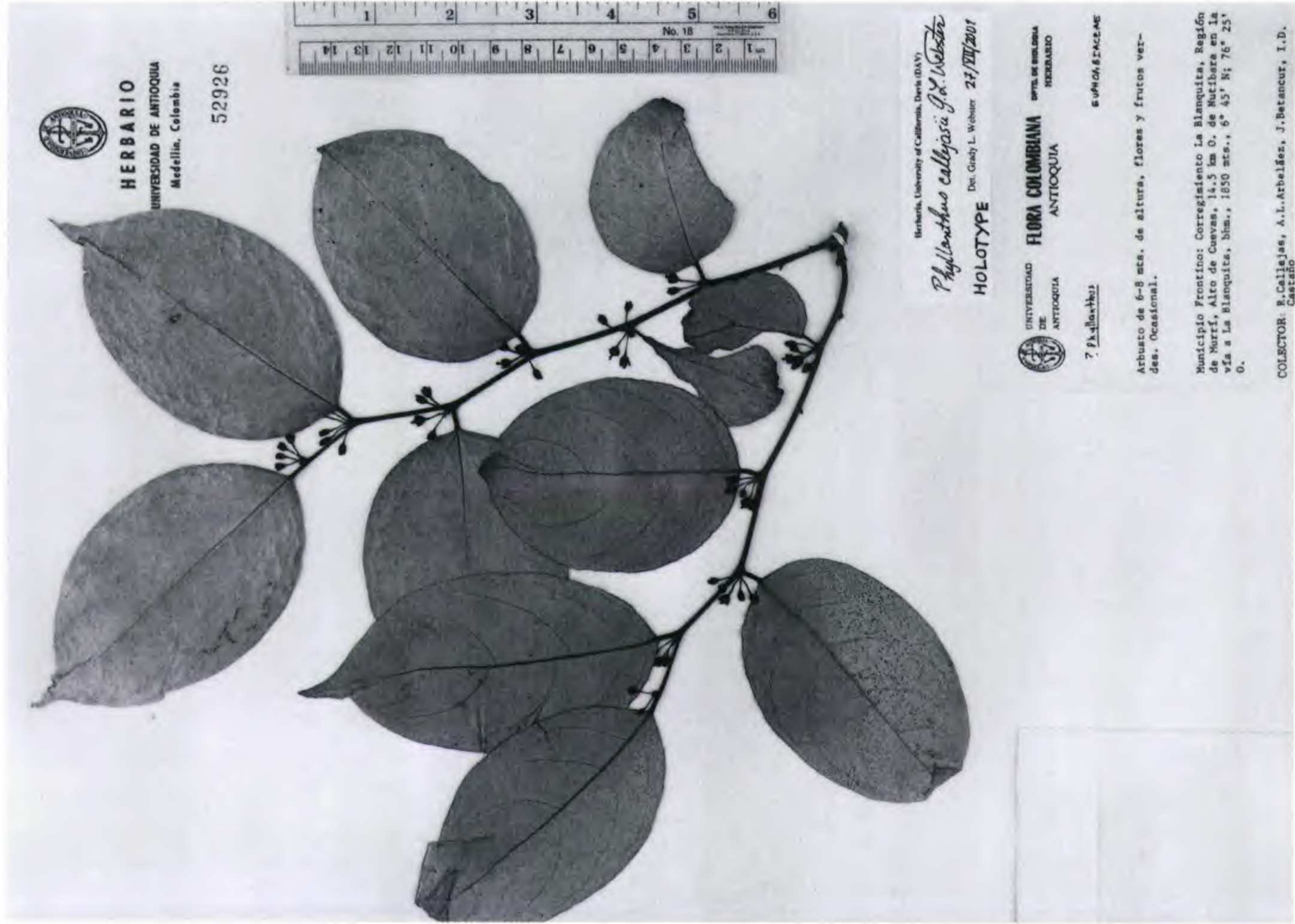
Amazonian rain forest, mostly on terra firme, ca. 200–300 m, Brazil (Amazonas, Pará). This species is sharply separated by a number of characters from the other species of the section, but the distinctive pollen sculpturing supports placement in *Phyllanthus* sect. *Hylaeanthus*.

Phyllanthus* subg. *Cyclanthera G. L. Webster, subg. nov. TYPE: *Phyllanthus lindenianus* Baillon.

Herbae monoicae, ramificatione more sectionis *Phyllanthi*; flores solitarii, axillares; sepala ♂ 5 vel 6; disci segmentis plerumque discretis; stamina 2 vel 3, connata; antherae discretae vel connatae, horizontaliter dehiscen-

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Figure 1. *Phyllanthus cuatrecasanus* G. L. Webster. — Left-hand photo. Type specimen (Cuatrecasas 8533, US). — Right-hand photo. Enlarged view of branch apex with deciduous branchlets.



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7 *Phyllanthus*
EUPHORBACEAE

Arbusto de 6-8 mts. de altura, flores y frutos verdes. Ocasional.

Municipio Frontino: Corregimiento La Blanquita, Región de Murci, Alto de Cuevas, 14.5 km O. de Mutibara en la vía a La Blanquita, bim., 1830 mts., 6° 45' N; 76° 25' O.

COLECTOR: R. Calles, A.L. Arbeláez, J. Betancur, I.D. Castro

tes; pollinis grana exinio clypeato; sepala ♀ 6; discus dissectus; ovarium 3-loculare; styli bifidi; fructus capsularis; semina scabridula vel verruculosa.

Monoecious annual or perennial herbs; branchlets pinnatifid or with one iterative lateral axis; flowers axillary, solitary; staminate sepals 5 or 6; disk dissected; stamens 2 or 3, filaments connate; anthers discrete or completely connate into a synandrium, dehiscing horizontally; pollen grains spheroidal, clypeate, the exine shields banded or circular; pistillate sepals 6; disk dissected, often purplish; ovary 3-locular, styles bifid; fruit capsular; seeds scabridulous or verruculose.

Phyllanthus subg. *Cyclanthera* includes two sections, section *Callitrichoides* G. L. Webster and section *Cyclanthera* G. L. Webster, both endemic to the Greater Antilles. When these sections were first treated (Webster, 1956–1958), they were included in subgenus *Phyllanthus*, but it was noted that they have extraordinary pollen grains somewhat comparable to the clypeate pollen grains (with exine shields) in subgenus *Xylophylla* (Halbritter & Hesse, 1995). Recent studies of pollen morphology (Webster & Carpenter, 2002) graphically indicate the divergence of the pollen grains in section *Cyclanthera* from all other taxa of *Phyllanthus*. It therefore seems necessary to remove these odd West Indian plants from subgenus *Phyllanthus* into a separate subgenus. The relationships of subgenus *Cyclanthera* still remain uncertain, although the distinctive pollen shows some resemblance to the pollen of subgenus *Emblica*.

Sect. 1. *Phyllanthus* sect. *Callitrichoides* G. L.
Webster, Contr. Gray Herb. 176: 51. 1955.
TYPE: *Phyllanthus carnosulus* Müller Argovensis.

One species endemic to eastern Cuba; apparently related to *Phyllanthus tenuicaulis* Müller Argovensis (in sect. *Cyclanthera*). This curious plant is vegetatively distinctive in its crisp-succulent leaves and stems rooting at the nodes. The pollen grains, in contrast to those of section *Cyclanthera*, have elongated exine shields (or perhaps could be interpreted as stephanocolporate). *Phyllanthus carnosulus* appears not to have been collected since it was found by Ekman over 70 years ago, so it is not certain whether it still survives.

Sect. 2. *Phyllanthus* sect. *Cyclanthera* G. L.
Webster, Contr. Gray Herb. 176: 47. 1955.
TYPE: *Phyllanthus lindenianus* Baillon.

Phyllanthus sect. *Cyclanthera* includes four species (and some subspecies) of Hispaniola, two of which also occur in eastern Cuba (Webster, 1956–1958). The section is very isolated within *Phyllanthus* by its highly modified androecium with unique clypeate pollen grains (illustrated by Webster & Carpenter, 2002).

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Figure 2. *Phyllanthus callejasii* G. L. Webster. —Left-hand photo. Type specimen with pistillate flowers (*Callejas et al.* 6864, HUA). —Right-hand photo. Specimen with fruits (*Betancur et al.* 2576, HUA).

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